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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,928	10/19/2001	Charles Eric Hunter	8159.0012-00	4062

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EXAMINER

PHAM, VAN T

ART UNIT	PAPER NUMBER
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2653

DATE MAILED: 06/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/082,928

Applicant(s)

HUNTER ET AL.

Examiner

VAN T. PHAM

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) 15-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 32-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>07/25/2002</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Invention I, claims 1-14 and 32-55 in the reply filed on 03/29/2005 is acknowledged.

Claims 15-31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 03/29/2005.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claim 49 (see page 7 of claims which the method of claim 47) been renumbered 48.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the plurality of holes arranged along a helix beginning near a center of the storage media and extending spirally outward, each successive pass of the helix being separated from a previous pass of the helix by a track pitch in claim 6, the plurality of holes circular and the largest dimension is a diameter of the circular holes, the diameter of the holes being in a range of about 30 to 100 nanometers in claim 7, a

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distance between successive holes, track pitch are in a range of about 30 to 100 nanometers in claims 8-9, the plurality of holes are circular and the largest dimension is a diameter of the circular holes, the diameter of the holes being about 100 nanometers, 50 or 60 nanometer and a distance between successive holes being about 100 nanometers, and the track pitch being about 100 nanometers in claims 10-11 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: in col. 2, line 7 of [0034], the layer "14" should be changed to layer -114--. In Fig. 3, there are light sources 204

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and in Fig. 4, also there are detectors 204. One of them should be changed to difference number to avoid confusing.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 6-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

There is inadequate disclosure of how to make and use :

Regarding claim 6, the plurality of holes arranged along a helix beginning near a center of the storage media and extending spirally outward, each successive pass of the helix being separated from a previous pass of the helix by a track pitch.

Regarding claim 7, the plurality of holes circular and the largest dimension is a diameter of the circular holes, the diameter of the holes being in a range of about 30 to 100 nanometers.

Regarding claims 8 and 9, a distance between successive holes, track pitch are in a range of about 30 to 100 nanometers.

Regarding claims 10 and 11, the plurality of holes are circular and the largest dimension is a diameter of the circular holes, the diameter of the holes being about 100 nanometers nor 50

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or 60 nanometer and a distance between successive holes being about 100 nanometers, and the track pitch being about 100 nanometers.

Applicant does not describe how to actually make a record medium with specific claimed features, merely that the claimed specifics are desired, thereby requiring undue experimentation.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-6, 12-13, 32, 37, 43-44, 49, and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chikuma et al. (US 5,182,669) in view of Kasada et al. (US 6,413,607).

Chikuma, according to Fig. 1A and col. 1, lines 57-68- col. 2, lines 1-12, which discloses a storage media for storage of data thereon, the storage media comprising: a first layer, the first layer being substantially transparent to a predetermined radiant energy used for reading the data (see Fig. 1A element 11); and a second layer formed on the first layer and being substantially opaque to the radiant energy (see Fig. 1A element 14), the second layer having a pattern comprising a plurality of holes (see abstract), the data being stored as the presence or absence of a hole in the pattern (see col. 1, lines 13-19). However, Chikuma does not disclose each of the holes having a largest dimension, which is greater than a wavelength of the radiant energy. Chikuma does disclose the relationship between sizes of pits and the wavelength of light (see col.1, lines 37-47).

Kasada, according to col. 30, lines 42-53, which discloses the optical recording media has

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each of the holes having a largest dimension which is greater than a wavelength of the radiant energy.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a storage media for storage of data thereon has each of the holes having a largest dimension, which is greater than a wavelength of the radiant energy in Chikuma as suggested by Kasada, the motivation being in order to improve the recording density especially for high density (see Kasada abstract).

Regarding claim 2, the combination of Chikuma and Kasada, which discloses the storage media of claim 1, wherein the first layer is polycarbonate (see Chikuma col. 2, lines 50-55);

Regarding claim 3, the combination of Chikuma and Kasada, which discloses the storage media of claim 1, wherein the second layer is a metalization coating (see Chikuma col. 2, lines 60-68 and col. Col. 3, lines 24-32);

Regarding claim 4, the combination of Chikuma and Kasada, which discloses the storage media of claim 3, wherein the metalization coating is aluminum (see Chikuma col. 2, lines 60-68);

Regarding claim 5, the combination of Chikuma and Kasada, which discloses the storage media of claim 1, wherein the plurality of holes are circular and the largest dimension is a diameter of the circular holes (inherent and see Chikuma Fig. 1A, element 12);

Regarding claim 6, the combination of Chikuma and Kasada, which discloses the storage media of claim 1, wherein the pattern comprises the plurality of holes arranged along a helix beginning near a center of the storage media and extending spirally outward, each successive pass of the helix being separated from a previous pass of the helix by a track pitch (see Chikuma

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col. 2, lines 28-35 and Fig. 2);

Regarding claim 12, the combination of Chikuma and Kasada, which discloses the storage media of claim 1, further comprising a third layer, the third layer being disposed on the second layer and being substantially transparent to the radiant energy (see Chikuma Fig. 1 element 13 and col. 3, lines 24-32);

Regarding claim 13, the combination of Chikuma and Kasada, which discloses the storage media of claim 12, wherein the third layer is acrylic (see Chikuma col. 2, line 52 and col. 3, lines 24-32);

Regarding claims 32 and 44, the combination of Chikuma and Kasada, which discloses an apparatus and a method for reading a storage media, the storage media comprising a first layer, the first layer being substantially transparent to a predetermined radiant energy used for reading the data; and a second layer formed on the first layer and being substantially opaque to the radiant energy, the second layer having a pattern comprising a plurality of data holes, each of the data holes having a largest dimension which is greater than a wavelength of the radiant energy, the data being stored as the presence or absence of a data hole in the pattern (see the rejection apply to claim 1), the apparatus comprising: a radiant energy source having an output of radiant energy directed towards the plurality of data holes (see Chikuma col. 2, lines 9-12); and a plurality of detectors for detecting the radiant energy diffusing from the plurality of data holes (see Chikuma col. 1, lines 13-19);

Regarding claims 37 and 49, the combination of Chikuma and Kasada, which discloses an apparatus and a method of claims 32 and 44, respectively, wherein the detectors are photodetectors (inherent);

Regarding claims 43 and 55, the combination of Chikuma and Kasada, which discloses an apparatus and a method of claims 32 and 44, respectively, wherein the radiant energy source is positioned on the side of the storage media having the first layer and is directed towards the detectors that are positioned on the side of the storage media opposite the first layer (see Chikuma Fig. 1A and 2F).

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chikuma et al. (US 5,182,669) in view of Kasada et al. (US 6,413,607) further in view of Suzuki (US 6,792,021).

Regarding claim 7, the combination of Chikuma and Kasada, which discloses the storage media of claim 6, has the plurality of holes. However, the combination of Chikuma and Kasada does not disclose the plurality of holes circular and the largest dimension is a diameter of the circular holes, the diameter of the holes being in a range of about 30 to 100 nanometers.

Suzuki, according to Fig. 2E and col. 4, lines 28, which discloses the plurality of holes circular and the largest dimension is a diameter of the circular holes, the diameter of the holes being in a range of about 30 to 100 nanometers.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a reading a storage media holes circular and the largest dimension is a diameter of the circular holes, the diameter of the holes being in a range of about 30 to 100 nanometers in the combination of Chikuma and Kasada as suggested by Suzuki, the motivation being in order to improve the recording density (see Suzuki col. 4, line 27).

10. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chikuma et al. (US 5,182,669) in view of Kasada et al. (US 6,413,607) further in view of Siegel (US

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6,288,996).

Regarding claim 14, the combination of Chikuma and Kasada, which discloses the storage media of claim 1, wherein the storage media is circular in shape. However, the combination of Chikuma and Kasada does not disclose a data storage area having an inner diameter of about 25 millimeters and an outer diameter of about 115 millimeters.

Seigel, according to col. 4, lines 26-45, which discloses the storage media is circular in shape and has a data storage area having an inner diameter of about 25 millimeters and an outer diameter of about 115 millimeters.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a reading a storage media a data storage area having an inner diameter of about 25 millimeters and an outer diameter of about 115 millimeters in the combination of Chikuma and Kasada as suggested by Seigel, the motivation being in order to balance or and even more preferably symmetrical (see Seigel col. 4, line 44).

11. Claims 33, 35-36, 45 and 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chikuma et al. (US 5,182,669) in view of Kasada et al. (US 6,413,607) further in view of Morimoto (US 6,091,693).

Regarding claims 33 and 45, the combination of Chikuma and Kasada, which discloses the apparatus and the method of claims 32 and 44, respectively, wherein the radiant energy source is a laser diode (see Chikuma Fig. 1, element 13). However, the combination of Chikuma and Kasada, does not disclose the radiant energy source is a blue laser diode.

Morimoto, according to col. 1, lines 21-38, which discloses a blue semiconductor laser using in optical recording medium.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide an apparatus and the method for reading a storage media blue semiconductor laser in the combination of Chikuma and Kasada as suggested by Morimoto, the motivation being in order to improve the recording density by shortening the output wavelength of a semiconductor laser (see Morimoto col. 1, lines 26-29);

Regarding claims 35, 36 and 47, 48 the combination of Chikuma, Kasada and Morimoto, which discloses the apparatus and the method of claims 35, 36 and 47, 48, respectively, wherein the radiant light source has a wavelength in the range of about 50 nanometers to 450 nanometers (the wavelength for the blue laser is about 410 nanometers).

12. Claims 34 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chikuma et al. (US 5,182,669) in view of Kasada et al. (US 6,413,607) further in view of Heffernan (US 6,303,473).

Regarding claims 34 and 46, the combination of Chikuma and Kasada, which discloses the apparatus and the method of claims 32 and 44, respectively, wherein the radiant energy source is a laser diode (see Chikuma Fig. 1, element 13). However, the combination of Chikuma and Kasada, does not disclose the radiant energy source is an ultraviolet laser diode.

Heffernan, according to col. 1, lines 14-25, which discloses an ultraviolet laser using in optical recording medium.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide an apparatus and the method for reading a storage media ultraviolet laser in the combination of Chikuma and Kasada as suggested by Heffernan, the motivation being in order to improve the recording density by shortening the output wavelength

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of a semiconductor laser (see col. 1, lines 14-25) (note this can apply to claims 33 and 45).

13. Claims 38-39 and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chikuma et al. (US 5,182,669) in view of Kasada et al. (US 6,413,607) further in view of Appelbaum et al. (US 5,039,578).

Regarding claims 38 and 50, the combination of Chikuma and Kasada, which discloses the apparatus and the method of claims 32 and 44, respectively, has photodetectors. However, the combination of Chikuma and Kasada does not disclose the photodetectors are formed of a wide bandgap material.

Appelbaum, according to col. 5, lines 15-46, which discloses the photodetectors are formed of a wide bandgap material.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide an apparatus and the method for reading a storage media the photodetectors are formed of a wide bandgap material in the combination of Chikuma and Kasada as suggested by Appelbaum, the motivation being in order to improve higher quantum efficiencies (see Appelbaum col. 1, lines 42-43).

Regarding claims 39 and 51, the combination of Chikuma, Kasada and Appelbaum, which discloses the wide bandgap material is selected from a group consisting of silicon carbide, gallium arsenide, gallium nitride, aluminum nitride, zinc selenide, gallium nitride/aluminum nitride alloy, aluminum nitride/silicon carbide alloy and aluminum gallium nitride/gallium nitride (see col. 5, lines 15-46).

14. Claims 40-42 and 52-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chikuma et al. (US 5,182,669) in view of Kasada et al. (US 6,413,607) further in view of

Feldman et al. (US 6,522,618).

Regarding claims 40 and 52, the combination of Chikuma and Kasada, which discloses the apparatus and the method of claims 32 and 44, respectively, has the storage media and the detectors for reducing interference from the radiant energy diffusing through unintended data holes. However, the combination of Chikuma and Kasada does not disclose a mask positioned between the storage media and the detectors for reducing interference from the radiant energy diffusing through unintended data holes.

Feldman, according to Figs. 3A-4C and col. 7, lines 57-67-col. 8, lines 1-13, which discloses disclose a mask positioned between the storage media and the detectors.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide an apparatus and the method for reading a storage media the a mask positioned between the storage media and the detectors in the combination of Chikuma and Kasada as suggested by Feldman, the motivation being in order to improve the position control and/or reading (see Feldman col. 2, line 64).

Regarding claims 41 and 53, the combination of Chikuma, Kasada and Feldman, which discloses the mask comprises a material having a pattern of mask holes arranged to restrict the number of data holes observed by a single detector (see Feldman Fig. 5);

Regarding claims 42 and 54, the combination of Chikuma, Kasada and Feldman, which discloses the mask holes are rectangular in shape (see Feldman Fig. 5) and have a smaller side dimension approximately equal to the largest dimension of the data holes (see Fig. 1C and col. 5, 7-63).

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Cited References

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The cited references relate high density optical disk and method of making.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to VAN T. PHAM whose telephone number is 571-272-7590. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on 571-272-7589. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VP

W. R. YOUNG
PRIMARY EXAMINER